

L Number	Hits	Search Text	DB	Time stamp
1	648	(electrode or lead) near10 (current) near10 (Mr or GMR or tmr)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/07 16:51
5	11494	oxid\$4 near10 (cap or ta)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/07 16:52
6	472	(cap or Ta) near10 (MR or gmr or tmr)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/07 16:52
8	12	((electrode or lead) near10 (current) near10 (Mr or GMR or tmr)) and (oxid\$4 near10 (cap or ta)) and ((cap or Ta) near10 (MR or gmr or tmr))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/07 16:52

US-PAT-NO: 6274025  
DOCUMENT-IDENTIFIER: US 6274025 B1  
TITLE: Chemical approach to develop  
lift-off photoresist structure and passivate MR sensor

----- KWIC -----

MR heads are manufactured by using a lift-off process to deposit lead layers and define reader track. In this process, a patterned double photo-sensitive layer structure is built on top to the sensor layer. By selectively photo-developing, the edge of the bottom photo-sensitive layer can be dissolved to form an undercut structure. When stabilization (exchange layer) and lead layers are physically deposited, the overhang of the top photo-sensitive will block deposition and define the MR reader edge. Unfortunately, the overspray 30A (of the lead layers 30) under the photoresist overhang will cause poor edge definition and product inconsistency. With a decrease in recording track width, the length of overspray (of lead and exchange layers) becomes a fairly large portion of track width and significantly impacts head performance.

The passivation layer 20 is preferably composed of NiCr, Ni(OH)<sub>2</sub>, Cr<sub>2</sub>O<sub>3</sub>, NiO, NiFeO, or metal hydroxide or metal oxides, Ta, Ti or NiFeO; and is most preferably composed of NiFeO. The passivation layer is preferably a product of the passivation/oxidation of the MR sensor. The passivation layer preferably has a thickness of between about 20 and 100 Å (tgt=50 Å).

The invention's passivation layer is (a) an electrical insulator, but (b) a heat conductor. The invention's passivation layer 20 is preferably composed of NiFeO and has a thickness of between about 50 and 150 .ANG.. In contrast, the Prior art's oxide layer or Ta layer are too thick to conduct heat away from the MR sensor.

3. The method of claim 1 wherein said passivation layer is composed of a material selected from the group consisting of NiCr, Ni(OH).sub.2, Cr.sub.2 O, NiO, or metal hydroxide, metal oxides, Ta, Ti and NiFeO.